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IS 3208 (1989): Engineers Drawing Instruments - Half Set of Compasses [PGD 22: Educational Instruments and Equipment]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

**ENGINEERS DRAWING INSTRUMENTS —
HALF SET OF COMPASSES — SPECIFICATION**

(First Revision)

भारतीय मानक

इंजीनियरी ड्राइंग उपकरण — परकारों का आधा सेट — विशिष्ट

(पहला पुनरीक्षण)

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 1 November 1989, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

Half set of compasses is a drawing instrument used by draftsmen and engineers to draw circles. It is provided with interchangeable pencil, pen or needle points and a lengthening bar.

This standard was originally published in 1965. This revision is based on further experience gained in the manufacture of drawing instruments and other developments in this field.

The main modifications are:

- a) Tolerances on important dimensions and mating parts have been specified.
- b) Nominal size l_1 has been modified as overall length.
- c) Overall length of half set compasses has been modified.

In preparing this standard due consideration has been given to manufacturing practices being followed in country and assistance has been derived from DIN 58505 : Einsatzzirkel für Präzisions — Rei Bzeuge (P) (Compass half set), issued by the Deutsche Norm.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ENGINEERS DRAWING INSTRUMENTS — HALF SET OF COMPASSES — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard covers the requirements for half set of compasses provided with interchangeable lengthening bar, pencil point, pen point or needle point for engineers' drawing instruments.

2 REFERENCES

IS No.	Title
IS 2500 (Part 1)-1973	Sampling inspection tables : Part 1 Inspection by attributes and by count of defects (<i>first revision</i>)
IS 3211 : 1965	Engineers' drawing instruments, pen points
IS 3212 : 1965	Engineers' drawing instruments, lengthening bars
IS 3214 : 1965	Engineers' drawing instruments, pencil points
IS 3215 : 1965	Engineers' drawing instruments, needle points
IS 3216 : 1989	Engineers' drawing instruments, needles (<i>first revision</i>)
IS 3222 (Part 1)-1989	Instrument screws : Part 1 Fasteners for drawing instru- ments (<i>first revision</i>)
IS 4827 : 1983	Electroplated coating of nickel and chromium on copper alloys (<i>first revision</i>)

3 MATERIAL

3.1 The material for manufacture of half set of compasses shall be rolled, drawn or cast brass (B), nickel silver (Ns) or stainless steel.

3.2 The material for manufacture of pen, pencil and needle point shall comply with the requirements as specified in IS 3211 : 1965, IS 3214 : 1965 and IS 3215 : 1965.

3.3 The material for manufacture of lengthening bar shall comply with the requirements as specified in IS 3212 : 1965.

4 DIMENSION

4.1 The dimensions of half set of compasses shall be as given in Table 1.

4.2 The dimensions and other requirements for pen, pencil and needle points shall be as specified in IS 3211 : 1965, IS 3214 : 1965 and IS 3215 : 1965.

4.3 The dimensions and other requirements of lengthening bars shall be as specified in IS 3212 : 1965.

4.4 The tolerance on interchangeable dimensions of pencil, and needle points and lengthening bars shall be as specified in relevant Indian Standard specification and shall be capable of being locked tight with the locking screw.

4.5 The figures are intended only to illustrate the dimensions and the design details are left to the discretion of the manufacturer so long as the specified dimensions are maintained.

5 DESIGNATION

Half set of compasses shall be designated by the nominal size h_1 , number of this standard and material.

Example :

Half set of compasses having nominal size $h_1 = 115$ mm and made from nickel silver (Ns) together with interchangeable lengthening bar, pen point, pencil point, needle point complete with needles and screw shall be designated as:

Half Set of Compasses 115 IS 3208 — Ns

6 GENERAL REQUIREMENTS

6.1 Half set of compasses shall comprise of two legs, one with a needle and other with a provision for carrying pencil point, pen point, needle point or lengthening bar. Each leg shall be provided with a joint to maintain the points vertical while drawing large circles.

6.2 Half set of compasses shall have preferably a self-centring arrangement and shall be provided with suitable arrangement for tightening the joints when they become loose.

7 WORKMANSHIP AND FINISH

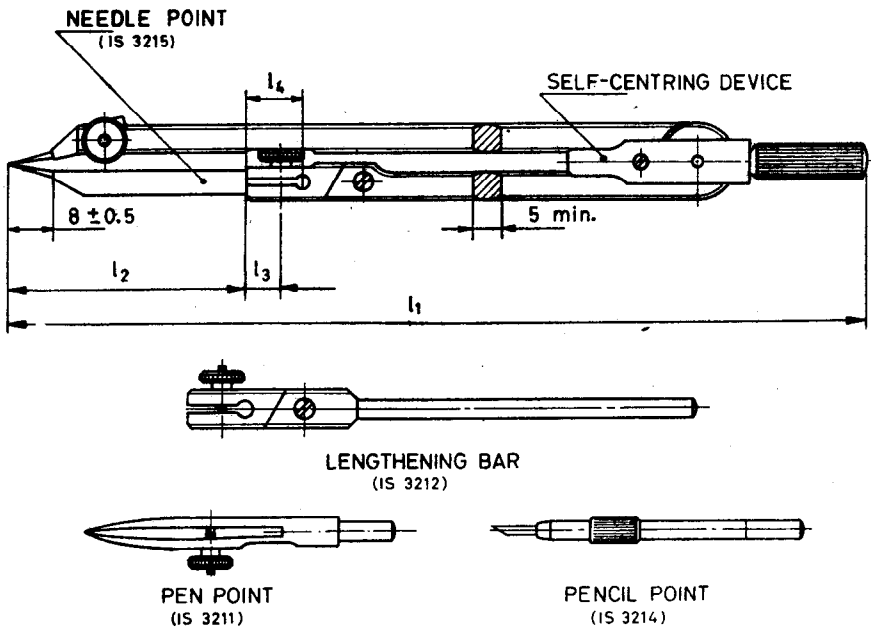
7.1 Half set of compasses shall be finished dull or bright.

7.1.1 When half set of compasses are made from brass, they shall be chromium plated to service Grade No. 1 according to IS 4827 : 1983.

7.1.2 When half set of compasses are made from nickel silver or stainless steel, they shall be polished and buffed.

Table 1 Dimensions for Half Set of Compasses
(Clause 4.1)

All dimensions in millimetres.



l_1 ± 1	l_2 ± 0.5	l_3 ± 0.5	l_4 Min
115	32	4.5	10
160 } 165 }	45	6	13

8 NEEDLES

The needles shall conform to the requirements as specified in IS 3216 : 1989.

9 SCREWS

The different screws used with half set of compasses shall conform to the requirements specified in IS 3222 (Part 1) : 1989.

10 SAMPLING

10.1 Lot

In a consignment all the half set of compasses of the same designation manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.

10.2 Unless otherwise agreed to between the supplier and the purchaser, the procedure given in IS 2500 (Part 1) : 1973 shall be followed for

sampling inspection. The inspection level, acceptable quality level (AQL) and type of sampling plan to be followed for various characteristics shall be as given in 10.2.1 and 10.2.2.

10.2.1 For dimensions, designation, general requirements, and workmanship and finish, a single sampling plan with inspection level IV and AQL of 2.5% as given in Tables 1 and 2 of IS 2500 (Part 1) : 1973 shall be followed.

10.2.2 For performance test a double sampling plan with inspection level II and AQL of 2.5% as given in Tables 1 and 3 of IS 2500 (Part 1) : 1973 shall be followed.

11 TESTS

11.1 Dimensional Test

The half set of compasses shall be tested for conformity with the requirements of dimensions specified in 4.1, 4.2, 4.3 and 4.4.

11.2 Performance Test

The half set of compasses shall be tested for smooth functioning. They shall open and close smoothly without jerk. A suitable apparatus may be used to close and open the two legs around the main joint and the force required for this purpose shall be 300 to 400 g.f. The half set of compasses shall be opened and closed for 1 000 operations. The reduction in force for opening and closing the half set of compasses shall not exceed the limit given below:

After 500 operations	50 percent, <i>Max</i>
After 1 000 operations	75 percent, <i>Max</i>

After 1 000 operations the main joints shall be reset and tested for a further 1 000 operations. In the retest the reduction in force shall not exceed the limits specified for the original setting.

11.2.1 The performance test for half set of compasses is a destructive test and should be con-

ducted according to the sampling plan previously agreed to between the purchaser and the manufacturer.

12 MARKING

The half set of compasses and its attachment shall be marked with the manufacturer's name or trade-mark at a suitable place.

13 PACKING

13.1 Half set of compasses and its attachments shall be first individually wrapped in paper and then packed in suitable carton.

13.2 Half set of compasses and its attachments may also be supplied as a part of an instruments set in which case the complete set may also be supplied in a suitable box.

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The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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